

1. Jim claims that $\angle A = \angle R$ in the provided triangles. Use **several methods to justify** Jim's claim.

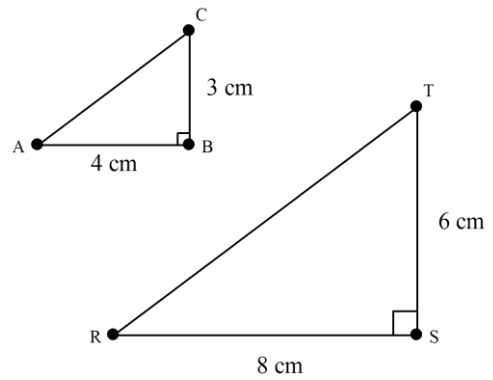
2. Two continuous linear relations are defined by:

Relation 1

$$y = 3x - 6$$

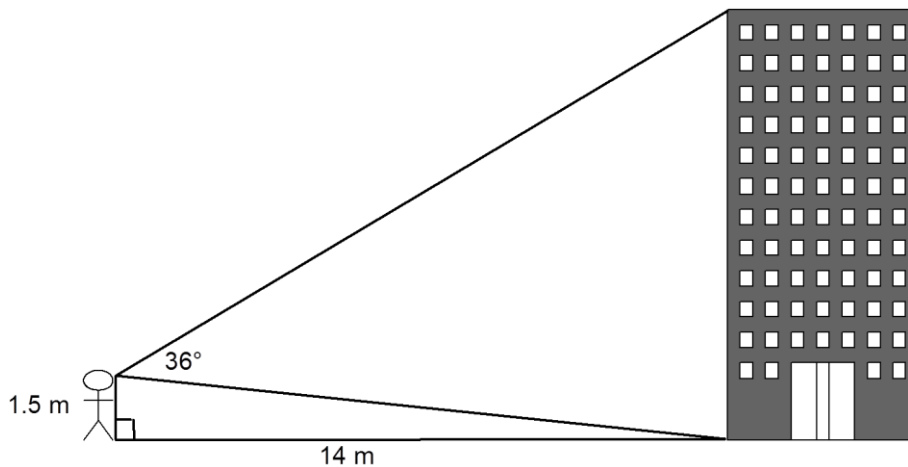
Relation 2

x	y
2	5
6	15
8	20
14	35



Determine the point of intersection of the lines defined by these relations. **Justify** your solution.

3. Jeff is 1.5 m tall. He is standing 14 m from a building. From his point of view, the bottom and top of the building are separated by 36° , as shown. How tall is the building? **Show your work.**



4. Kristen purchased a bag of jelly beans and gummy worms. Jelly beans cost 50 cents/kg and gummy worms cost 80 cents/kg. Kristen purchased 4kg of candy for a total of \$3.00. **State the system of equations that could be used to determine the quantity of each type of candy she purchased. (Remember to define your variables)**

5. Paula and Francine have each designed and tested a mini-rocket during their summer science camp at the Museum of Science and Technology. Paula's rocket lands 20 metres from the launch point and achieves a maximum height of 60 metres. Francine's rocket, launched from the same point, lands 40 metres away and also achieves a maximum height of 60 metres.

(a) Why might the flight paths be different? **Explain** your thinking. (Assume that they follow parabolic trajectories.)

(b) The rockets are launched towards a 20 m tall observation building. If both rockets clear the observation building, **determine** what you can about the width of the building? **Justify** your answer.

6. Maria and Scott want to determine the x -intercepts of the quadratic relation defined by $y = x^2 + 2x - 8$. They make the representation shown on the right. **Determine** the x -intercepts of the relation.
7. How many zeros does the relation defined by $y = -2(x + 1)^2 - 1$ have? **Explain** how you know.
8. The point A is $(-5, -4)$, and B is $(5, 0)$. **Determine** the equation of the perpendicular bisector of AB.
9. **Show** that the lines with equations $2x - 5y = 20$, $x - 7y = 19$, and $3x - y = 17$ pass through a common point. Determine the point of intersection. **Verify** your answer.
10. A ladder is leaning up against a wall. The base of the ladder is 1 m from the wall and the ladder makes a 75° angle with the ground. How high up the wall does the ladder reach? **Show your work.**
11. **Determine** the value of x .

